POINTING INPUT DEVICE AND ELECTRONIC EQUIPMENT PROVIDED WITH THE SAME

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Abstract of **JP9134248**

PROBLEM TO BE SOLVED: To improve operability and to miniaturize a pointing input device by eliminating plural operation keys and smoothly operating plural operation objects with one finger. SOLUTION: A disk-like operation key 21 is provided on a remote control casing 11 so that it can slide. A slide switch 230 detects a slide movement operation and the operation face of the operation key 21 is divided into four. Pressure sensors 221-224 are arranged on the divided areas and the depression operation of the operation key 21 is detected. Item movement information L7 is generated based on the detection signal L4 of the slide operation and a cursor movement information L3 is generated based on the detection signal L12 of the depression operation. The positions of a pointer for menu item selection K2 and a cursor K1, which are displayed on the display screen of a television receiver, are moved in accordance with the contents of information.
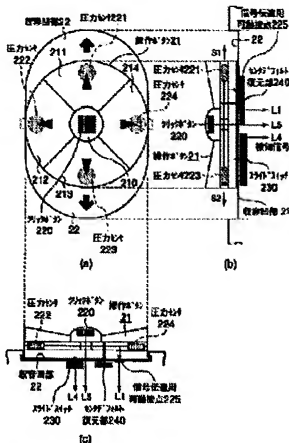
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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to electronic equipment provided with a pointing input device and these input devices, such as a remote controller used in order to operate electronic equipment, such as a television television system, a personal computer, a Personal Digital Assistant device, by remote control, for example.
[0002]
[Description of the Prior Art]For example, there are many types which a user has in a hand a remote controller (a remote control is called henceforth) used in order to operate a television television system by remote control, and are operated. This kind of remote control is constituted so that a user may support a remote control from a rear face with four fingers other than the thumb and may generally do pushing operation of the button of a remote-control-operation side with the thumb. That is, button grabbing of a remote control is usually performed with one finger.
[0003]By the way, the various functions type television television system is variously developed with promotion of multimedia in recent years. In this kind of device, selection operation of a menu and moving operation of cursor may be performed, respectively, for example. In order to operate two or more of these operation targets, the conventional remote control, As shown in <u>drawing 6</u>, corresponding to two or more operation targets, on the navigational panel of a remote control For example, two or more manual operation buttons, For example, as the item go button B1 and cursor advance button B-2 are provided or it is shown in <u>drawing 7</u>, the one changeover switch SW for manual operation button B and operation target selection is provided on the navigational panel of a remote control.
[0004]However, in such a conventional remote control, in order to carry out selection operation of two or more manual operation buttons B1 and B-2, it must change with a remote control or must shift the position of a finger greatly, or. After operating the changeover switch SW first and specifying the operation target, the position of the finger had to be moved greatly, manual operation button B had to be operated, and operativity was bad.
[0005]In order to have to provide the manual operation button B1 of the number according to the number of operation targets, and B-2 on the navigational panel of a remote control and to have to form the changeover switch SW, large-sized-ization of the remote control was caused. Although it is necessary to miniaturize a manual operation button to avoid this large-sized-ization, if a manual operation button is miniaturized, the fall of operativity is caused and it is not desirable.
[0006]
[Problem(s) to be Solved by the Invention]As mentioned above, the conventional pointing input device has the fault of causing large-sized-ization of a device while having difficulty in operativity. Then, it enables it to operate two or more operation targets smoothly with one finger, without this invention making unnecessary two or more manual operation buttons, and moving an actuated valve

position greatly, It is in providing electronic equipment provided with the pointing input device which can attain improvement in operativity, and the miniaturization of a device by this, and this input device.
[0007]
[Means for Solving the Problem]To achieve the above objects, a pointing input device of this invention, As a structure which supports a plate-like manual operation button which has a size corresponding to an abdomen of fingers with a base material so that slide movement is possible, Form a sliding operation detection means to detect slide movement operation information on a manual operation button over this base material, and distributed allocation of two or more pressure sensors is carried out further in the above-mentioned manual operation button side, A depression operation detection means which detects depression operation information over the above-mentioned manual operation button based on an output signal of these pressure sensors is established, and operation information which operates two or more functions in which it became independent respectively, by the above-mentioned sliding operation detection means and a depression operation detection means is inputted.
[0008]Therefore, according to the pointing input device of this invention, it becomes possible to input information for operating two or more targets by sliding operation of one manual operation button, and depression operation, respectively. For this reason, a user becomes possible [inputting smoothly], without changing operation information over two or more operation targets with fingers, or shifting a position of a finger greatly. Since what is necessary is just to provide one manual operation button to two or more operation targets, a miniaturization of a device can be attained compared with a case where provide another manual operation button for every operation target, or a changeover switch is provided separately. Since it is not necessary to miniaturize a manual operation button, there is also no fear of causing a fall of operativity by miniaturization of a manual operation button.
[0009]He is trying to detect information showing direction to depression operation to a direction which intersects perpendicularly based on an output signal of two or more pressure sensors to holddown pressure ability and a depression manipulating direction of depression operation to a manual operation button, and information what is called on vector quantity in the above-mentioned depression operation detection means. For this reason, two-dimensional moving operation information can be acquired by depression operation, and it becomes possible to carry out two-dimensional movement of the cursor at high speed and smoothly to a desired position by this.
[0010]Furthermore, a depression operation detection means has the minimum detection sensitivity of holddown pressure power set up beforehand, in order to identify depression operation and slide movement operation to a manual operation button, and it is characterized also by detecting holddown pressure power exceeding this minimum detection sensitivity as depression operation information. Therefore, it becomes possible to identify depression operation to a manual operation button still more clearly than slide movement operation, and to detect it, and an input device excellent in operativity which an erroneous input does not produce easily by this can be provided.
[0011]
[Embodiment of the Invention]Drawing 1 is a top view showing the 1 embodiment of the pointing input device concerning this invention. This pointing input device is a remote control for various functions type television television systems, and The key button group 3 for channel selections in that navigational panel 1, The pointing operation part 2 for performing the selection of a menu item and movement of cursor which were displayed on the display screen is allocated, respectively.
[0012]The pointing operation part 2 is provided with the following.
The push button 21 which makes discoid.
Female housing 22 which makes the ellipse formed in the case 11 in order to accommodate this push button 21 to the figure Nakamae back so that slide movement is possible.

[0013]Drawing 2 shows the composition of the pointing operation part 2, and the top view, (b), and (c) of (a) are sectional side elevations. In the figure, the operation sides of the manual operation button 21 comprise the center section 210 which makes the shape of a hemisphere, and the peripheral parts 211–214 quadrisected with equiangularity. Among these, the peripheral parts 211–214 are formed so that the surface may carry out a declivity loosely toward the above-mentioned center section 210 from a peripheral edge, respectively. These declivity sides are things for improving the operativity of the depression operation mentioned later which receive the manual operation button 21.

[0014]Inside the peripheral parts 211–214 quadrisected [above-mentioned], the pressure sensors 211–224 are allocated, respectively. It is for these pressure sensors 221–224 detecting the depression operation to the manual operation button 21, and the depression detection signal L1 is inputted into the cursor advance detector circuit 41 later mentioned via the traveling contact 225 for signal transduction. The click button 230 is allocated inside the operation-sides center section 210. When this click button 230 determines a menu item, depression operation of it is carried out, and the click signal L5 generated by depression operation is inputted into the click detector circuit 43 mentioned later.

[0015]On the other hand, the slide switch 230 is allocated in the case of female housing 22 lower part. This slide switch 230 is for detecting the control input of the sliding operation of the manual operation button 21 in the female housing 22, and that slide detection signal L5 is inputted into the item move detector circuit 42 mentioned later.

[0016]The manual operation button 21 is mechanically connected to the center default restoration section 240. This center default restoration section 240 makes a center position carry out the auto return of the manual operation button 21 after sliding operation.

[0017]Drawing 3 is a circuit block figure showing the important section composition of a remote control circuit. In the figure, the depression detection signal L1 outputted from each pressure sensors 221–224 of the pointing operation part 2 is inputted into the cursor advance detector circuit 41. Based on the level of the depression detection signal L1 of each above-mentioned pressure sensors 221–224, this cursor advance detector circuit 41 detects the vector and size of the depression operation to the manual operation button 21, and supplies them to the central control unit (CPU) 44 by making that detection result into the cursor advance information L2.

[0018]When performing the level judging of the above-mentioned depression detection signal L1, the cursor advance detector circuit 41, As compared with the minimum detection sensitivity level of the pressure which set up the level of the detection signal L1 beforehand first, only when the level of the depression detection signal L1 is over this minimum detection sensitivity level, it judges that the above-mentioned depression detection signal L1 is effective, and detection of a depression operation vector and its size is performed. The above-mentioned minimum detection sensitivity level is more expensive than the depression detection signal level L1 outputted from each pressure sensors 221–224 when sliding operation of the manual operation button 21 is carried out enough, And when a user performs depression operation of the manual operation button 21 intentionally, it is set as the value which becomes less than depression detection signal level L1 outputted from each pressure sensors 221–224.

[0019]The slide detection signal L4 outputted from the slide switch 230 is inputted into the item move detector circuit 42. This item move detector circuit 42 judges the level of the above-mentioned slide detection signal L4, generates the item movement information L7, and supplies this item movement information L7 to CPU44.

[0020]The click signal L5 outputted from the click button 220 is inputted into the click detector circuit 43. When it judges whether click operation was performed from the click signal L5 of the above-mentioned click button 220 and judges with click operation having been performed, the click detector circuit 43 generates item decision information L6, and supplies it to CPU44.

[0021]CPU4 is supplied to the infrared transmitter 45 by making the print-out into the menu item

selection information L3, whenever it is supervising the output of the information from the above-mentioned cursor advance detector circuit 41, the item move detector circuit 42, and the click detector circuit 43 and information is outputted. The infrared transmitter 45 generates the infrared rays modulated by the menu item selection information L3 supplied from the above-mentioned CPU44, and transmits towards the television television system which does not illustrate these infrared rays L8.

[0022]A television television system receives the infrared rays transmitted from the above-mentioned remote control in an infrared receive section, and restores to menu item selection information in this infrared receive section. And according to this menu item selection information to which it restored, the position of the cursor K1 on display to a display screen and the pointer K2 for menu item directions is moved.

[0023]Since it is such composition, suppose that depression operation of the manual operation button 21 of the remote control was carried out with the thumb of the hand as a user showed drawing 5 in the state where the cursor K1 and the pointer K2 are displayed as shown in drawing 4 now at a display screen, for example. If it does so, this depression operation will be detected by the cursor advance detector circuit 41, the item move detector circuit 42, and the click detector circuit 43, The information showing the detection result is sent to a television television system from a remote control by infrared rays, and, thereby, the cursor K1 on a display screen and the display position of the pointer K2 move.

[0024]For example, in order for a user to move the cursor K1 in the direction shown in PP1 of drawing 4 now, suppose that the peripheral part 211 was pushed among the peripheral parts 211-214 of the quadrisected manual operation button side as shown in P1 drawing 5. If it does so, this depression operation will be detected mainly by the pressure sensor 221, and that detection signal L1 will be inputted into the cursor advance detector circuit 41. In the cursor advance detector circuit 41, the level of the above-mentioned detection signal L1 is first compared with the minimum detection sensitivity level. And if the level of the detection signal L1 is more expensive than the minimum detection sensitivity level, The cursor advance information L2 which is judged that the above-mentioned detection signal is a signal by regular depression operation, and consists of a depression operation vector and its size based on the above-mentioned detection signal L1 continuously is created, After this operation information passes through CPU44, it is transmitted towards a television television system from the infrared transmitter 45.

[0025]In a television television system, reception of the above-mentioned operation information will perform control only for the length equivalent to the above-mentioned size to move the position of the cursor K1 on display to a display screen in the direction of PP1 of drawing 4 according to the contents of this information, i.e., a move direction vector, and its size.

[0026]Supposing it pushes the peripheral part 214 of a manual operation button side as shown in P4 of drawing 5 so that a user may move the cursor K1 in the direction shown in PP4 of drawing 4 shortly, This depression operation is detected mainly by the pressure sensor 224, and that detection signal L1 is inputted into the cursor advance detector circuit 41. In the cursor advance detector circuit 41, it is judged first whether the level of the above-mentioned detection signal L1 is more expensive than the minimum detection sensitivity level, and if the level of the detection signal L1 is more expensive than the minimum detection sensitivity level, It is judged that the above-mentioned detection signal is a signal by regular depression operation, and the cursor advance information L2 which consists of a depression operation vector and its size based on the above-mentioned detection signal L1 is created. And after this operation information passes through CPU44, it is transmitted towards a television television system from the infrared transmitter 45.

[0027]Control only for the length equivalent to the above-mentioned size to move the position of the cursor K1 on display to a display screen in the direction of PP4 of drawing 4 according to the move direction vector expressed with a television television system using this information when the above-mentioned operation information is received, and its size is performed.

[0028]Like the following, whenever a user does the depression of the four peripheral parts 211-214 of the manual operation button 21 selectively, The operation information which consists of the vector and size of that depression operation is sent to a television television system from a remote control, and the display position of the cursor K1 of a display screen moves according to this operation information.

[0029]The depression of the two peripheral parts corresponding to the direction is carried out simultaneously to move the cursor K1 to the oblique direction on a display screen instead of a sliding direction or a longitudinal direction. If it does so, the vector of the above-mentioned depression operation and its size will be detected in the cursor advance detector circuit 41 based on the detection signal L1 of each pressure sensors 221-224, this operation information is sent to a television television system, and, as a result, the position of the cursor K1 on a display screen responds to the above-mentioned vector -- an oblique direction -- and only the length equivalent to that size moves.

[0030]On the other hand, in order to choose the item M2 among the menu items M1-M5, it uses that the user made the manual operation button 21 slide in the arrow S1 direction shown in drawing 5 small. If it does so, this sliding operation will be detected by the slide switch 230, and, as for that detection signal L4, that level will be judged in the item move detector circuit 42. This level judging is made by comparing the above-mentioned detection signal level with the threshold of four pieces beforehand set up corresponding to the menu items M1-M5, for example. And if the movement destination of the pointer K2 is judged by the above-mentioned level judging, after the information passes through CPU44, it will be transmitted towards a television television system from the infrared transmitter 45.

[0031]In a television television system, reception of the above-mentioned operation information will perform control for moving the position of the pointer K2 for the menu item selection on a display screen to M2 from the item M3 according to the contents, as shown in arrow SS1 of drawing 4. In drawing 4, the case where it is displaying in highlighting the pointer K2 is illustrated.

[0032]On the contrary, in order to choose the menu item M5, it uses having made it slide in the direction of the arrow S2 greatly, as a user shows drawing 5 the manual operation button 21. If it does so, this sliding operation will be detected by the slide switch 230, and, as for that detection signal L4, that level will be judged in the item move detector circuit 42. And if the movement destination of the pointer K2 is judged by this level judging, after that information passes through CPU44, it will be transmitted towards a television television system from the infrared transmitter 45.

[0033]In a television television system, reception of the above-mentioned operation information will perform control for moving the position of the pointer K2 for the menu item selection on a display screen to M5 from the item M3 according to the contents, as shown in arrow SS2 of drawing 4.

[0034]Similarly hereafter, whenever a user makes the manual operation button 21 slide to a cross direction, The direction and the amount of moving operation of that moving operation are detected in the item move detector circuit 42, the operation information showing that detection result is sent to a television television system from a remote control, and the display position of the pointer K2 for menu item selection of a display screen moves in step according to this operation information.

[0035]Then, if the pointer K2 moves onto a menu item to choose and a user does click operation of the click button 220 in this state, the click signal L5 will be inputted into the click detector circuit 43, and item decision information L6 will be created in the click detector circuit 43. And after that item decision information L6 goes via CPU44, it is transmitted towards a television television system from the infrared transmitter 45. In a television television system, arrival of above-mentioned item decision information L6 will perform control for choosing the menu item corresponding to the current position of the pointer K2.

[0036]While the manual operation button 21 which makes a disk top is formed in the remote control case 11 by this embodiment as mentioned above so that slide movement is possible, and the slide

switch 230 detects this slide movement operation, Quadrisect the operation sides of the above-mentioned manual operation button 21, allocate the pressure sensors 221–224 in these region divisions, respectively, and depression operation of the manual operation button 21 is detected, While generating the item movement information L7 based on the detection signal L4 of the above-mentioned sliding operation, He generates the cursor advance information L2 based on the detection signal L1 of the above-mentioned depression operation, and is trying to move the pointer K2 for menu item selection and the position of the cursor K1 which are displayed on the display screen of a television television system according to the contents of these information.

[0037]Therefore, according to this embodiment, depression operation and sliding operation of the one manual operation button 21 enable it to perform movement of the cursor K1, and movement of the pointer K2 for menu item selection, respectively. For this reason, a user becomes possible [inputting smoothly], without having a remote control, and changing the operation information over two independent operation targets called the cursor K1 and the pointer K2, or shifting the position of a finger greatly. Since what is necessary is just to provide one manual operation button, the miniaturization of a remote control can be attained compared with the case where provide another manual operation button for every operation target, or a changeover switch is provided separately. Since it is not necessary to miniaturize the manual operation button 21, there is also no fear of inviting aggravation of the operativity by the miniaturization of the manual operation button 21.

[0038]Only when a detection signal level is larger than this minimum pressure detection response level as compared with the minimum pressure detection response level which defined beforehand the detection signal level of the pressure sensors 221–224, he is trying to generate the cursor advance information L2 based on the above-mentioned detection signal L1 in this embodiment. For this reason, it becomes possible to identify still more clearly than sliding operation the depression operation to the manual operation button 21, and to detect it, and the remote control excellent in the operativity which an erroneous input does not produce easily by this can be provided.

[0039]This invention is not limited to the above-mentioned embodiment. For example, without restricting in the direction of one dimension, in the direction of two dimensions, the direction of slide movement of the manual operation button 21 may be constituted so that slide movement is possible, and it may be constituted so that a click mechanism may be provided in a sliding mechanism and the pointer 2 to two or more items can be moved to it in step.

[0040]In said embodiment, when the click button 220 is pushed, it is also expected that the pressure sensors 221–224 and the cursor advance detector circuit 41 will operate if the manipulating direction of the depression is not perpendicular, and the position of the cursor K1 changes unwillingly. So, when it is detected that the click button 220 was pushed, it is good to be made to perform processing which repeals the operation information detected in the cursor advance detector circuit 41 at this time.

[0041]Although depression operation of the manual operation button 21 was detected in said embodiment using the pressure sensors 221–224, A manual operation button is constituted centering on that central part, enabling free rocking, this rocking operation is detected using a displacement pickup etc., and it may be made to generate cursor advance information based on that detection result.

[0042]Although said embodiment explained this invention using the remote control, otherwise, this invention is applicable to key input sections, such as a personal computer of a note type or a subnote type, an electronic notebook and a portable telephone, a portable television set, and a game machine.

[0043]In addition, also with the composition of the shape of a manual operation button, its structure, the supporting structure of a manual operation button, a sliding operation detection means, and a depression operation detection means, and the kind of operation target, in the range which does not deviate from the gist of this invention, it changes variously and can carry out.

[0044]

[Effect of the Invention]As explained in full detail above, in this invention, as a structure which supports the plate-like manual operation button which has a size corresponding to the abdomen of fingers with a base material so that slide movement is possible, Form a sliding operation detection means to detect the slide movement operation information on a manual operation button over this base material, and distributed allocation of two or more pressure sensors is carried out further in the above-mentioned manual operation button side, He establishes the depression operation detection means which detects the depression operation information over the above-mentioned manual operation button based on the output signal of these pressure sensors, and is trying to input the operation information which operates two or more functions in which it became independent respectively, by the above-mentioned sliding operation detection means and a depression operation detection means.

[0045]Therefore, according to this invention, two or more operation targets can be smoothly operated with one finger, without making unnecessary two or more manual operation buttons, and moving an actuated valve position greatly, Electronic equipment provided with the pointing input device which can attain improvement in operativity and the miniaturization of a device by this, and this input device can be provided.

[Translation done.]

* NOTICES *

TECHNICAL FIELD

[Field of the Invention]This invention relates to electronic equipment provided with a pointing input device and these input devices, such as a remote controller used in order to operate electronic equipment, such as a television television system, a personal computer, a Personal Digital Assistant device, by remote control, for example.

[Translation done.]

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PRIOR ART

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[Description of the Prior Art]For example, there are many types which a user has in a hand a remote controller (a remote control is called henceforth) used in order to operate a television television system by remote control, and are operated. This kind of remote control is constituted so that a user may support a remote control from a rear face with four fingers other than the thumb and may generally do pushing operation of the button of a remote-control-operation side with the thumb. That is, button grabbing of a remote control is usually performed with one finger.
[0003]By the way, the various functions type television television system is variously developed with promotion of multimedia in recent years. In this kind of device, selection operation of a menu and moving operation of cursor may be performed, respectively, for example. In order to operate two or more of these operation targets, the conventional remote control, As shown in <u>drawing 6</u>, corresponding to two or more operation targets, on the navigational panel of a remote control For example, two or more manual operation buttons, For example, as the item go button B1 and cursor advance button B-2 are provided or it is shown in <u>drawing 7</u>, the one changeover switch SW for manual operation button B and operation target selection is provided on the navigational panel of a remote control.
[0004]However, in such a conventional remote control, in order to carry out selection operation of two or more manual operation buttons B1 and B-2, it must change with a remote control or must shift the position of a finger greatly, or. After operating the changeover switch SW first and specifying the operation target, the position of the finger had to be moved greatly, manual operation button B had to be operated, and operativity was bad.
[0005]In order to have to provide the manual operation button B1 of the number according to the number of operation targets, and B-2 on the navigational panel of a remote control and to have to form the changeover switch SW, large-sized-ization of the remote control was caused. Although it is necessary to miniaturize a manual operation button to avoid this large-sized-ization, if a manual operation button is miniaturized, the fall of operativity is caused and it is not desirable.

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EFFECT OF THE INVENTION

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supports the plate-like manual operation button which has a size corresponding to the abdomen of
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TECHNICAL PROBLEM

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MEANS

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[0014]Inside the peripheral parts 211-214 quadrisected [above-mentioned], the pressure sensors 211-224 are allocated, respectively. It is for these pressure sensors 221-224 detecting the depression operation to the manual operation button 21, and the depression detection signal L1 is inputted into the cursor advance detector circuit 41 later mentioned via the traveling contact 225 for signal transduction. The click button 230 is allocated inside the operation-sides center section 210. When this click button 230 determines a menu item, depression operation of it is carried out, and the click signal L5 generated by depression operation is inputted into the click detector circuit 43 mentioned later.
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[0017]Drawing 3 is a circuit block figure showing the important section composition of a remote control circuit. In the figure, the depression detection signal L1 outputted from each pressure sensors 221-224 of the pointing operation part 2 is inputted into the cursor advance detector circuit 41. Based on the level of the depression detection signal L1 of each above-mentioned pressure sensors 221-224, this cursor advance detector circuit 41 detects the vector and size of the depression operation to the manual operation button 21, and supplies them to the central control unit (CPU) 44 by making that detection result into the cursor advance information L2.
[0018]When performing the level judging of the above-mentioned depression detection signal L1, the cursor advance detector circuit 41, As compared with the minimum detection sensitivity level of the pressure which set up the level of the detection signal L1 beforehand first, only when the level of the depression detection signal L1 is over this minimum detection sensitivity level, it judges that the above-mentioned depression detection signal L1 is effective, and detection of a depression operation vector and its size is performed. The above-mentioned minimum detection sensitivity level is more expensive than the depression detection signal level L1 outputted from each pressure sensors 221-224 when sliding operation of the manual operation button 21 is carried out enough, And when a user performs depression operation of the manual operation button 21 intentionally, it is set as the value which becomes less than depression detection signal level L1 outputted from each pressure sensors 221-224.

[0019]The slide detection signal L4 outputted from the slide switch 230 is inputted into the item move detector circuit 42. This item move detector circuit 42 judges the level of the above-mentioned slide detection signal L4, generates the item movement information L7, and supplies this item movement information L7 to CPU44.

[0020]The click signal L5 outputted from the click button 220 is inputted into the click detector circuit 43. When it judges whether click operation was performed from the click signal L5 of the above-mentioned click button 220 and judges with click operation having been performed, the click detector circuit 43 generates item decision information L6, and supplies it to CPU44.

[0021]CPU44 is supplied to the infrared transmitter 45 by making the print-out into the menu item selection information L3, whenever it is supervising the output of the information from the above-mentioned cursor advance detector circuit 41, the item move detector circuit 42, and the click detector circuit 43 and information is outputted. The infrared transmitter 45 generates the infrared rays modulated by the menu item selection information L3 supplied from the above-mentioned CPU44, and transmits towards the television television system which does not illustrate these infrared rays L8.

[0022]A television television system receives the infrared rays transmitted from the above-mentioned remote control in an infrared receive section, and restores to menu item selection information in this infrared receive section. And according to this menu item selection information to which it restored, the position of the cursor K1 on display to a display screen and the pointer K2 for menu item directions is moved.

[0023]Since it is such composition, suppose that depression operation of the manual operation button 21 of the remote control was carried out with the thumb of the hand as a user showed drawing 5 in the state where the cursor K1 and the pointer K2 are displayed as shown in drawing 4 now at a display screen, for example. If it does so, this depression operation will be detected by the cursor advance detector circuit 41, the item move detector circuit 42, and the click detector circuit 43, The information showing the detection result is sent to a television television system from a remote control by infrared rays, and, thereby, the cursor K1 on a display screen and the display position of the pointer K2 move.

[0024]For example, in order for a user to move the cursor K1 in the direction shown in PP1 of drawing 4 now, suppose that the peripheral part 211 was pushed among the peripheral parts 211-214 of the quadrisected manual operation button side as shown in P1 of drawing 5. If it does so, this depression operation will be detected mainly by the pressure sensor 221, and that detection signal L1 will be inputted into the cursor advance detector circuit 41. In the cursor advance detector circuit 41, the level of the above-mentioned detection signal L1 is first compared with the minimum detection sensitivity level. And if the level of the detection signal L1 is more expensive than the minimum detection sensitivity level, The cursor advance information L2 which is judged that the above-mentioned detection signal is a signal by regular depression operation, and consists of a depression operation vector and its size based on the above-mentioned detection signal L1 continuously is created, After this operation information passes through CPU44, it is transmitted towards a television television system from the infrared transmitter 45.

[0025]In a television television system, reception of the above-mentioned operation information will perform control only for the length equivalent to the above-mentioned size to move the position of the cursor K1 on display to a display screen in the direction of PP1 of drawing 4 according to the contents of this information, i.e., a move direction vector, and its size.

[0026]Supposing it pushes the peripheral part 214 of a manual operation button side as shown in P4 of drawing 5 so that a user may move the cursor K1 in the direction shown in PP4 of drawing 4 shortly, This depression operation is detected mainly by the pressure sensor 224, and that detection signal L1 is inputted into the cursor advance detector circuit 41. In the cursor advance detector circuit 41, it is judged first whether the level of the above-mentioned detection signal L1 is more expensive than the minimum detection sensitivity level, and if the level of the detection signal L1 is

more expensive than the minimum detection sensitivity level, It is judged that the above-mentioned detection signal is a signal by regular depression operation, and the cursor advance information L2 which consists of a depression operation vector and its size based on the above-mentioned detection signal L1 is created. And after this operation information passes through CPU44, it is transmitted towards a television television system from the infrared transmitter 45.

[0027]Control only for the length equivalent to the above-mentioned size to move the position of the cursor K1 on display to a display screen in the direction of PP4 of drawing 4 according to the move direction vector expressed with a television television system using this information when the above-mentioned operation information is received, and its size is performed.

[0028]Like the following, whenever a user does the depression of the four peripheral parts 211-214 of the manual operation button 21 selectively, The operation information which consists of the vector and size of that depression operation is sent to a television television system from a remote control, and the display position of the cursor K1 of a display screen moves according to this operation information.

[0029]The depression of the two peripheral parts corresponding to the direction is carried out simultaneously to move the cursor K1 to the oblique direction on a display screen instead of a sliding direction or a longitudinal direction. If it does so, the vector of the above-mentioned depression operation and its size will be detected in the cursor advance detector circuit 41 based on the detection signal L1 of each pressure sensors 221-224, this operation information is sent to a television television system, and, as a result, the position of the cursor K1 on a display screen responds to the above-mentioned vector -- an oblique direction -- and only the length equivalent to that size moves.

[0030]On the other hand, in order to choose the item M2 among the menu items M1-M5, it uses that the user made the manual operation button 21 slide in the arrow S1 direction shown in drawing 5 small. If it does so, this sliding operation will be detected by the slide switch 230, and, as for that detection signal L4, that level will be judged in the item move detector circuit 42. This level judging is made by comparing the above-mentioned detection signal level with the threshold of four pieces beforehand set up corresponding to the menu items M1-M5, for example. And if the movement destination of the pointer K2 is judged by the above-mentioned level judging, after the information passes through CPU44, it will be transmitted towards a television television system from the infrared transmitter 45.

[0031]In a television television system, reception of the above-mentioned operation information will perform control for moving the position of the pointer K2 for the menu item selection on a display screen to M2 from the item M3 according to the contents, as shown in arrow SS1 of drawing 4. In drawing 4, the case where it is displaying in highlighting the pointer K2 is illustrated.

[0032]On the contrary, in order to choose the menu item M5, it uses having made it slide in the direction of the arrow S2 greatly, as a user shows drawing 5 the manual operation button 21. If it does so, this sliding operation will be detected by the slide switch 230, and, as for that detection signal L4, that level will be judged in the item move detector circuit 42. And if the movement destination of the pointer K2 is judged by this level judging, after that information passes through CPU44, it will be transmitted towards a television television system from the infrared transmitter 45.

[0033]In a television television system, reception of the above-mentioned operation information will perform control for moving the position of the pointer K2 for the menu item selection on a display screen to M5 from the item M3 according to the contents, as shown in arrow SS2 of drawing 4.

[0034]Similarly hereafter, whenever a user makes the manual operation button 21 slide to a cross direction, The direction and the amount of moving operation of that moving operation are detected in the item move detector circuit 42, the operation information showing that detection result is sent to a television television system from a remote control, and the display position of the pointer K2 for menu item selection of a display screen moves in step according to this operation information.

[0035]Then, if the pointer K2 moves onto a menu item to choose and a user does click operation of the click button 220 in this state, the click signal L5 will be inputted into the click detector circuit 43, and item decision information L6 will be created in the click detector circuit 43. And after this item decision information L6 goes via CPU44, it is transmitted towards a television television system from the infrared transmitter 45. In a television television system, arrival of above-mentioned item decision information L6 will perform control for choosing the menu item corresponding to the current position of the pointer K2.

[0036]While the manual operation button 21 which makes a disk top is formed in the remote control case 11 by this embodiment as mentioned above so that slide movement is possible, and the slide switch 230 detects this slide movement operation, Quadrisect the operation sides of the above-mentioned manual operation button 21, allocate the pressure sensors 221-224 in these region divisions, respectively, and depression operation of the manual operation button 21 is detected, While generating the item movement information L7 based on the detection signal L4 of the above-mentioned sliding operation, He generates the cursor advance information L2 based on the detection signal L1 of the above-mentioned depression operation, and is trying to move the pointer K2 for menu item selection and the position of the cursor K1 which are displayed on the display screen of a television television system according to the contents of these information.

[0037]Therefore, according to this embodiment, depression operation and sliding operation of the one manual operation button 21 enable it to perform movement of the cursor K1, and movement of the pointer K2 for menu item selection, respectively. For this reason, a user becomes possible [inputting smoothly], without having a remote control, and changing the operation information over two independent operation targets called the cursor K1 and the pointer K2, or shifting the position of a finger greatly. Since what is necessary is just to provide one manual operation button, the miniaturization of a remote control can be attained compared with the case where provide another manual operation button for every operation target, or a changeover switch is provided separately. Since it is not necessary to miniaturize the manual operation button 21, there is also no fear of inviting aggravation of the operativity by the miniaturization of the manual operation button 21.

[0038]Only when a detection signal level is larger than this minimum pressure detection response level as compared with the minimum pressure detection response level which defined beforehand the detection signal level of the pressure sensors 221-224, he is trying to generate the cursor advance information L2 based on the above-mentioned detection signal L1 in this embodiment. For this reason, it becomes possible to identify still more clearly than sliding operation the depression operation to the manual operation button 21, and to detect it, and the remote control excellent in the operativity which an erroneous input does not produce easily by this can be provided.

[0039]This invention is not limited to the above-mentioned embodiment. For example, without restricting in the direction of one dimension, in the direction of two dimensions, the direction of slide movement of the manual operation button 21 may be constituted so that slide movement is possible, and it may be constituted so that a click mechanism may be provided in a sliding mechanism and the pointer 2 to two or more items can be moved to it in step.

[0040]In said embodiment, when the click button 220 is pushed, it is also expected that the pressure sensors 221-224 and the cursor advance detector circuit 41 will operate if the manipulating direction of the depression is not perpendicular, and the position of the cursor K1 changes unwillingly. So, when it is detected that the click button 220 was pushed, it is good to be made to perform processing which repeals the operation information detected in the cursor advance detector circuit 41 at this time.

[0041]Although depression operation of the manual operation button 21 was detected in said embodiment using the pressure sensors 221-224, A manual operation button is constituted centering on that central part, enabling free rocking, this rocking operation is detected using a displacement pickup etc., and it may be made to generate cursor advance information based on that detection result.

[0042]Although said embodiment explained this invention using the remote control, otherwise, this invention is applicable to key input sections, such as a personal computer of a note type or a subnote type, an electronic notebook and a portable telephone, a portable television set, and a game machine.

[0043]In addition, also with the composition of the shape of a manual operation button, its structure, the supporting structure of a manual operation button, a sliding operation detection means, and a depression operation detection means, and the kind of operation target, in the range which does not deviate from the gist of this invention, it changes variously and can carry out.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The top view showing the 1 embodiment of the pointing input device concerning this invention.
[Drawing 2]The top view and sectional side elevation showing the composition of a pointing operation part.
[Drawing 3]The circuit block figure showing the important section composition of a remote control circuit.
[Drawing 4]The figure showing the cursor as an operation target, and the display example of a pointer.
[Drawing 5]The figure showing the operating condition of a manual operation button.
[Drawing 6]The top view showing an example of the conventional pointing input device.
[Drawing 7]The top view showing other examples of the conventional pointing input device.
[Description of Notations]
1 -- Navigational panel
2 -- Pointing operation part
3 -- Key button group
11 -- Remote control case
21 -- Manual operation button
22 -- Female housing of a manual operation button
41 -- Cursor advance detector circuit
42 -- Item move detector circuit
43 -- Click detector circuit
44 -- CPU
45 -- Infrared transmitter
210 -- Center section of the manual operation button side
211-214 -- Peripheral part by which the manual operation button side was quadrisected
220 -- Click button
221-224 -- Pressure sensor
225 -- Traveling contact for signal transduction
230 -- Slide switch
240 -- Center default restoration section
L1 -- Depression detection signal
L2 -- Cursor advance information
L3 -- Menu item selection information
L4 -- Slide detection signal
L5 -- Click signal
L6 -- Item decision information

L7 -- Item movement information
L8 -- Modulated infrared rays

[Translation done.]

CLAIMS

[Claim(s)]
[Claim 1]A pointing input device which is provided with the following and characterized by inputting
operation information on ** which operates two or more functions to become independent
respectively, by said sliding operation detection means and said depression operation detection
means.
A plate-like manual operation button which has a size corresponding to an abdomen of fingers.
A base material for supporting this manual operation button so that slide movement is possible.
A sliding operation detection means for detecting slide movement operation information on said
manual operation button over this base material.
A depression operation detection means for having two or more pressure sensors by which
distributed allocation was carried out in said manual operation button side, and detecting depression
operation information over said manual operation button based on an output signal of these pressure
sensors.

[Claim 2]The pointing input device according to claim 1, wherein a depression operation detection
means detects information showing direction to depression operation to a direction which intersects
perpendicularly to holddown pressure ability and a depression manipulating direction of depression
operation to a manual operation button based on an output signal of two or more pressure sensors.
[Claim 3]The pointing input device according to claim 1 or 2, wherein a depression operation
detection means detects holddown pressure power which has the minimum detection sensitivity of
holddown pressure power set up beforehand in order to identify depression operation and slide
movement operation to a manual operation button, and exceeds this minimum detection sensitivity
as depression operation information.
[Claim 4]Electronic equipment comprising:
An operation executing means which performs predetermined operation.
A displaying means which displays display information concerning operation performed by this
operation executing means with two or more pointing information.
A plate-like manual operation button which possesses a pointing input means to which a display
position of two or more pointing information displayed on this displaying means is moved
independently, respectively, and has a size corresponding to an abdomen of fingers in said pointing
input means.
A base material for supporting this manual operation button so that slide movement is possible, and
a sliding operation detection means for detecting slide movement operation information on said
manual operation button over this base material, A depression operation detection means for having
two or more pressure sensors by which distributed allocation was carried out in said manual
operation button side, and detecting depression operation information over said manual operation
button based on an output signal of these pressure sensors, A means for inputting operation

information detected by said sliding operation detection means and said depression operation detection means as information for moving said two or more pointing information, respectively.

[Translation done.]

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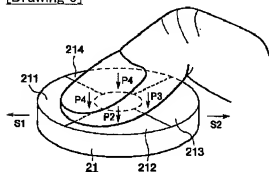damages caused by the use of this translation.

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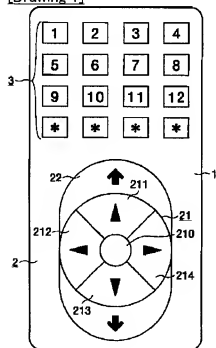precisely.
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DRAWINGS

[Drawing 5]

[Drawing 1]

[Drawing 2]

(a)

(b)

(c)
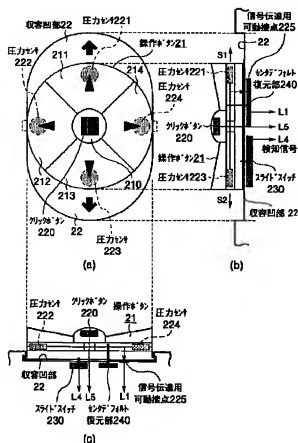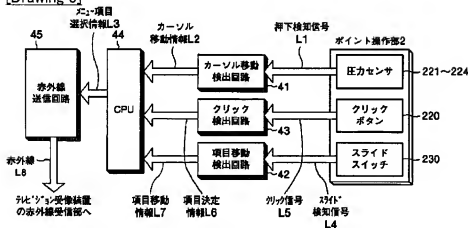
[Drawing 3]

[Drawing 4]
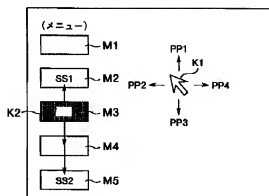
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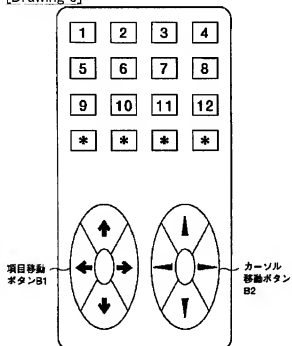
[Drawing 7]
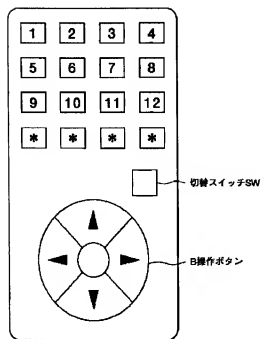
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(71)出願人　000003078

　　　　　株式会社東芝

　　　　　神奈川県川崎市幸区堀川町72番地

(72)発明者　関根　正則

　　　　　神奈川県横浜市磯子区新杉田町 8 番地　株
　　　　　式会社東芝マルチメディア技術研究所内

(72)発明者　田代　成

　　　　　神奈川県横浜市磯子区新杉田町 8 番地　株
　　　　　式会社東芝マルチメディア技術研究所内

(74)代理人　弁理士　鈴江　武彦

(54)【発明の名称】　ポインティング入力装置およびこの入力装置を備えた電子機器

(57)【要約】

【課題】　複数の操作ボタンを不要にするとともに、複数の操作対象を手指 1 本で円滑に操作できるようにして、操作性の向上と装置の小形化を図る。

【解決手段】　円盤上をなす操作ボタン21をリモコン筐体11にスライド移動可能に設けて、このスライド移動操作をスライドスイッチ230で検出するとともに、上記操作ボタン21の操作面を 4 分割してこれらの分割領域にそれぞれ圧力センサ221～224を配設して操作ボタン21の押下操作を検出するようにし、上記スライド操作の検知信号L4を基に項目移動情報L7を生成するとともに、上記押下操作の検知信号L1を基にカーソル移動情報L2を生成して、これらの情報の内容に応じてテレビジョン受像装置のディスプレイ画面上に表示されているメニュー項目選択用のポインタK2およびカーソルK1の位置を移動させるようにしたものである。
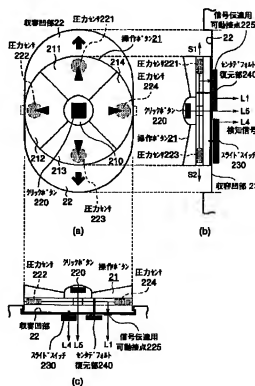
【特許請求の範囲】

【請求項１】　手指の腹部に対応する大きさを有する平板状の操作ボタンと、

この操作ボタンをスライド移動可能に支持するための支持体と、

この支持体に対する前記操作ボタンのスライド移動操作情報を検出するためのスライド操作検出手段と、

前記操作ボタン面に分散配設された複数の圧力センサを有し、これらの圧力センサの出力信号を基に前記操作ボタンに対する押下操作情報を検出するための押下操作検出手段とを具備し、

前記スライド操作検出手段および前記押下操作検出手段により、各々独立した複数の機能を動作させるための操作情報を入力するようにしたことを特徴とするポインティング入力装置。

【請求項２】　押下操作検出手段は、複数の圧力センサの出力信号を基に、操作ボタンに対する押下操作圧力量および押下操作方向に対し直交する方向への押下操作の向きを表わす情報を検出することを特徴とする請求項１記載のポインティング入力装置。

【請求項３】　押下操作検出手段は、操作ボタンに対する押下操作とスライド移動操作とを識別するために予め設定した押下圧力の最低検出感度を有し、この最低検出感度を超える押下圧力を押下操作情報として検出することを特徴とする請求項１または２記載のポインティング入力装置。

【請求項４】　所定の動作を実行する動作実行手段と、

この動作実行手段により実行される動作に係わる表示情報を複数のポインティング情報とともに表示する表示手段と、

この表示手段に表示される複数のポインティング情報の表示位置をそれぞれ独立に移動させるポインティング入力手段とを具備し、

前記ポインティング入力手段は、

手指の腹部に対応する大きさを有する平板状の操作ボタンと、

この操作ボタンをスライド移動可能に支持するための支持体と、

この支持体に対する前記操作ボタンのスライド移動操作情報を検出するためのスライド操作検出手段と、

前記操作ボタン面に分散配設された複数の圧力センサを有し、これらの圧力センサの出力信号を基に前記操作ボタンに対する押下操作情報を検出するための押下操作検出手段と、

前記スライド操作検出手段および前記押下操作検出手段により検出された操作情報をそれぞれ前記複数のポインティング情報を移動させるための情報として入力するための手段とを備えたことを特徴とする電子機器。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】この発明は、例えばテレビジョン受像装置やパーソナルコンピュータ、携帯情報端末装置などの電子機器を遠隔操作するために使用されるリモートコントローラなどのポインティング入力装置およびこの入力装置を備えた電子機器に関する。

【０００２】

【従来の技術】例えば、テレビジョン受像装置を遠隔操作するために使用されるリモートコントローラ（以後リモコンと称する）は、ユーザが手に持って操作するタイプが多い。この種のリモコンは、一般にユーザが親指以外の４本の指でリモコンの裏面から支え、親指でリモコン操作面のボタンを押し操作するように構成されている。すなわち、リモコンのボタン操作は通常指１本で行なわれる。

【０００３】ところで、近年マルチメディアの推進に伴い多機能型のテレビジョン受像装置が種々開発されている。この種の装置においては、例えばメニューの選択操作とカーソルの移動操作をそれぞれ行なう場合がある。これらの複数の操作対象を操作するために従来のリモコンは、例えば図６に示すようにリモコンパネル上に複数の操作対象に対応して複数の操作ボタン、例えば項目移動ボタンＢ１およびカーソル移動ボタンＢ２を設けるか、あるいは図７に示すようにリモコンの操作パネル上に１個の操作ボタンＢと操作対象選択用の切替スイッチＳＷを設けている。

【０００４】ところが、このような従来のリモコンでは、複数の操作ボタンＢ１、Ｂ２を選択操作するためにリモコンを持ち変えるか指の位置を大きくシフトしなければならなかったり、また先ず切替スイッチＳＷを操作して操作対象を指定した上で指の位置を大きく移動させて操作ボタンＢを操作しなければならず、操作性が悪かった。

【０００５】また、リモコンの操作パネル上に操作対象の数に応じた数の操作ボタンＢ１、Ｂ２を設けなければならなかったり、また切替スイッチＳＷを設けなければならないため、リモコンの大形化を招いていた。なお、この大形化を回避するには操作ボタンを小形化する必要があるが、操作ボタンを小形化すると操作性の低下を招くなど好ましくない。

【０００６】

【発明が解決しようとする課題】以上のように従来のポインティング入力装置は、操作性が悪いとともに装置の大形化を招くという不具合を有している。そこでこの発明は、複数の操作ボタンを不要にして、操作位置を大きく移動させることなく複数の操作対象を手指１本で円滑に操作できるようにして、これにより操作性の向上と装置の小形化を図ることができるポインティング入力装置およびこの入力装置を備えた電子機器を提供することにある。

【０００７】

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【課題を解決するための手段】上記目的を達成するためにこの発明のポインティング入力装置は、手指の腹部に対応する大きさを有する平板状の操作ボタンをスライド移動可能に支持する構造として、この支持体に対する操作ボタンのスライド移動操作情報を検出するスライド操作検出手段を設け、さらに上記操作ボタン面に複数の圧力センサを分配配設して、これらの圧力センサの出力信号を基に上記操作ボタンに対する押下操作情報を検出する押下操作検出手段を設け、上記スライド操作検出手段および押下操作検出手段により、各々独立した複数の機能を動作させる操作情報を入力するようにしたものである。

【０００８】したがってこの発明のポインティング入力装置によれば、１個の操作ボタンのスライド操作と押下操作とにより複数の操作対象を操作するための情報をそれぞれ入力することが可能となる。このため、ユーザは複数の操作対象に対し操作ボタンを手指を持ち変えずに指の位置を大きくシフトさせることなくスムーズに入力することが可能となる。また、複数の操作対象に対し１個の操作ボタンを設けるだけですむため、各操作対象ごとに別の操作ボタンを設けたり切替スイッチを別途設ける場合に比べて装置の小型化を図ることができる。さらに、操作ボタンを小形化する必要もないため、操作ボタンの小形化による操作性の低下も心配もない。

【０００９】また上記押下操作検出手段では、複数の圧力センサの出力信号を基に、操作ボタンに対する押下操作の押下圧力量と、押下操作方向に対し直交する方向の押下操作の向きを表わす情報、いわゆるベクトル量の情報を検出するようにしている。このため、押下操作により二次元の移動操作情報を得ることができ、これにより例えばカーソルを所望の位置へ高速かつスムーズに二次元移動させることが可能となる。

【００１０】さらに押下操作検出手段は、操作ボタンに対する押下操作とスライド移動操作とを識別するために予め設定した押下圧力の最低検出感度を有し、この最低検出感度を超える押下圧力を押下操作情報として検出することも特徴としている。したがって、操作ボタンに対する押下操作をスライド操作より一層明確に識別して検出することが可能となり、これにより誤入力の生じ難い操作性に優れた入力装置を提供することができる。

【００１１】
【発明の実施の形態】図１は、この発明に係るポインティング入力装置の一実施の形態を示す平面図である。このポインティング入力装置は多機能型テレビジョン受像装置用のリモコンであり、その操作パネル１にはチャンネル選択用のキーボタン群３と、ディスプレイ画面に表示されたメニュー項目の選択およびカーソルの移動を行なうためのポイント操作部２とがそれぞれ配設されている。

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【００１２】ポイント操作部２は、円盤状をなす押しボタン２１と、この押しボタン２１を図中前後方向へスライド移動可能に収容するために筐体１１に形成された長円形をなす収容凹部２２とを備えている。

【００１３】図２はポイント操作部２の構成を示すもので、（ａ）はその平面図、（ｂ）および（ｃ）は側断面図である。同図において、押しボタン２１は、半球状をなす中央部２１０と、等角度で４分割された周囲部２１１〜２１４とから構成される。このうち周囲部２１１〜２１４はその表面が周端から上記中央部２１０に向かって緩く下り傾斜するように形成されている。これらの下り傾斜面は、操作ボタン２１に対する後述する押下操作の操作性を高めるためのものである。

【００１４】上記４分割された周囲部２１１〜２１４の内部には、それぞれ圧力センサ２１１〜２２４が配設されている。これらの圧力センサ２２１〜２２４は操作ボタン２１に対する押下操作情報を検出するもので、その押下検知信号Ｌ１は信号伝達用可動接点２２５を介して後述するカーソル移動検出回路４１に入力される。また、操作面中央部２１０の内部にはクリックボタン２３０が配設されている。このクリックボタン２３０は、メニュー項目の決定を行なう際に押下操作されるもので、押下操作により発生したクリック信号Ｌ５は後述するクリック検出回路４３に入力される。

【００１５】一方、収容凹部２２下方の筐体内にはスライドスイッチ２３０が配設されている。このスライドスイッチ２３０は、収容凹部２２内における操作ボタン２１のスライド操作の操作量を検出するためのもので、そのスライド検知信号Ｌ５は後述する項目移動検出回路４２に入力される。

【００１６】なお、操作ボタン２１はセンタデフォルト復元部２４０に機械的に接続されている。このセンタデフォルト復元部２４０は、スライド操作後の操作ボタン２１をセンタ位置に自動復帰させるものである。

【００１７】図３は、リモコン回路の要部構成を示す回路ブロック図である。同図において、ポイント操作部２の各圧力センサ２２１〜２２４から出力された押下検知信号Ｌ１はカーソル移動検出回路４１に入力される。このカーソル移動検出回路４１は、上記各圧力センサ２２１〜２２４の押下検知信号Ｌ１のレベルに基づいて、操作ボタン２１に対する押下操作のベクトルとその大きさを検出し、その検出結果をカーソル移動情報Ｌ２として中央制御ユニット（ＣＰＵ）４４へ供給する。

【００１８】なお、上記押下検知信号Ｌ１のレベル判定を行なう際にカーソル移動検出回路４１では、まず押下検知信号Ｌ１のレベルを予め設定した圧力の最低検出感度レベルと比較し、押下検知信号Ｌ１のレベルがこの最低検出感度レベルを超えている場合にのみ当該押下検知信号Ｌ１を有効と判定して押下操作ベクトルとその大きさの検出を行なう。上記最低検出感度レベルは、操作ボタン２

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1をスライド操作したときに各圧力センサ２２１〜２２４から出力される押下検知信号レベルＬ１よりも十分に高く、かつユーザが意識的に操作ボタン２１の押下操作を行なったときに各圧力センサ２２１〜２２４から出力される押下検知信号レベルＬ１以下となる値に設定される。

【００１９】スライドスイッチ２３０から出力されたスライド検知信号Ｌ４は項目移動検出回路４２に入力される。この項目移動検出回路４２は、上記スライド検知信号Ｌ４の変化を判定して項目移動情報Ｌ７を生成し、この項目移動情報Ｌ７をＣＰＵ４４に供給する。

【００２０】クリックボタン２２０から出力されたクリック信号Ｌ５はクリック検出回路４３に入力される。クリック検出回路４３は、上記クリックボタン２２０のクリック信号Ｌ５からクリック操作が行なわれたか否かを判定し、クリック操作が行なわれたと判定した場合に項目決定情報Ｌ６を生成し、このＣＰＵ４４に供給する。

【００２１】ＣＰＵ４は、上記カーソル移動検出回路４１、項目移動検出回路４２およびクリック検出回路４３からの情報の出力を監視しており、情報が出力されるごとにその出力情報をメニュー項目選択情報Ｌ３として赤外線送信回路４５に供給する。赤外線送信回路４５は、上記ＣＰＵ４４から供給されたメニュー項目選択情報Ｌ３により変調された赤外線を発生し、この赤外線Ｌ８を図示しないテレビジョン撮像装置に向け送信する。

【００２２】テレビジョン撮像装置は、上記リモコンから送信される赤外線を赤外線受信部で受信し、この赤外線受信部でメニュー項目選択情報を復調する。そして、この復調されたメニュー項目選択情報に応じて、ディスプレイ画面に表示中のカーソルＫ１およびメニュー項目指示用のポインタＫ２の位置を移動させる。

【００２３】このような構成であるから、例えばいまディスプレイ画面に図４に示すごとくカーソルＫ１およびポインタＫ２が表示されている状態で、ユーザが図５に示すごとくリモコンの操作ボタン２１を手の親指で押下操作したとする。そうすると、この押下操作はカーソル移動検出回路４１、項目移動検出回路４２およびクリック検出回路４３により検出されて、その検出結果を表わす情報が赤外線によりリモコンからテレビジョン撮像装置に送られ、これによりディスプレイ画面上のカーソルＫ１およびポインタＫ２の表示位置が移動する。

【００２４】例えば、ユーザがいまカーソルＫ１を図４のＰＰ１に示す方向に移動させるために、４分割された操作ボタン面の周囲部２１１〜２１４のうち周囲部２１１を図５のＰ１に示すように押下したとする。そうすると、この押下操作は主として圧力センサ２２１により検出され、その検知信号Ｌ１がカーソル移動検出回路４１に入力される。カーソル移動検出回路４１では上記検知信号Ｌ１のレベルが最低検出感度レベルと比較される。そして、検知信号Ｌ１のレベルが最低検出感度

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ベルよりも高ければ、上記検知信号は正規の押下操作による信号であると判断され、続いて上記検知信号Ｌ１を基に押下操作ベクトルおよびその大きさからなるカーソル移動情報Ｌ２が作成されて、このカーソル移動情報Ｌ２を経たのち赤外線送信回路４５からテレビジョン撮像装置に向け送信される。

【００２５】テレビジョン撮像装置では、上記操作情報が受信されるとこの情報の内容、つまり移動方向ベクトルとその大きさに応じて、ディスプレイ画面に表示中のカーソルＫ１の位置を図４のＰＰ１の方向に上記大きさに相当する長さだけ移動させるための制御が行なわれる。

【００２６】また、ユーザがカーソルＫ１を今度は図４のＰＰ４に示す方向に移動させるべく、操作ボタン面の周囲部２１４を図５のＰ４に示すように押下したとすると、この押下操作は主として圧力センサ２２４により検出され、その検知信号Ｌ１がカーソル移動検出回路４１に入力される。カーソル移動検出回路４１では、先ず上記検知信号Ｌ１のレベルが最低検出感度レベルよりも高いかどうかが判定され、検知信号Ｌ１のレベルが最低検出感度レベルよりも高ければ、上記検知信号は正規の押下操作による信号であると判断されて、上記検知信号Ｌ１を基に押下操作ベクトルおよびその大きさからなるカーソル移動情報Ｌ２が作成される。そして、この操作情報がＣＰＵ４４を経たのち赤外線送信回路４５からテレビジョン撮像装置に向け送信される。

【００２７】テレビジョン撮像装置では、上記操作情報が受信されると、この情報により表わされる移動方向ベクトルとその大きさに応じて、ディスプレイ画面に表示中のカーソルＫ１の位置を図４のＰＰ４の方向に上記大きさに相当する長さだけ移動させるための制御が行なわれる。

【００２８】以下同様に、ユーザが操作ボタン２１の４つの周囲部２１１〜２１４を選択的に押下するごとに、押下操作のベクトルと大きさとからなる操作情報がリモコンからテレビジョン撮像装置に送られ、この操作情報に応じてディスプレイ画面のカーソルＫ１の表示位置が移動する。

【００２９】なお、カーソルＫ１を上下方向あるいは左右方向ではなく、ディスプレイ画面上の斜め方向へ移動させたい場合には、その方向に対応する２つの周囲部を同時に押下する。すると各圧力センサ２２１〜２２４の検知信号Ｌ１を基に、カーソル移動検出回路４１で上記押下操作のベクトルおよびその大きさが検出されて、この操作情報がテレビジョン撮像装置に送られ、この結果ディスプレイ画面上のカーソルＫ１の位置は上記ベクトルに応じて斜め方向に、かつその大きさに相当する長さだけ移動する。

【００３０】一方、メニュー項目Ｍ１〜Ｍ５のうち項目Ｍ２を選択するために、ユーザが操作ボタン２１を図５

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に示す矢印Ｓ１方向に小さくスライドさせたとする。そうすると、このスライド操作はスライドスイッチ２３０により検出され、その検知信号Ｌ４は項目移動検出回路４２において判定される。このレベル判定では、例えば上記検知信号レベルをメニュー項目Ｍ１～Ｍ５に対応して予め設定された４個のしきい値と比較することによりポインタＫ２の移動先が判定されると、その情報はＣＰＵ４４を経たのち赤外線送信回路４５からテレビジョン受像装置に向け送信される。

【００３１】テレビジョン受像装置では、上記操作情報が受信されると、その内容にしたがってディスプレイ画面上のメニュー項目選択用のポインタＫ２の位置を、図４の矢印Ｓ１に示すごとく項目Ｍ３からＭ２に移動させるための制御が行なわれる。なお、図４ではポインタＫ２を反転表示することで表示している場合を例示している。

【００３２】また反対に、メニュー項目Ｍ５を選択するために、ユーザが操作ボタン２１を図５に示すごとく矢印Ｓ２の方向へ大きくスライドさせたとする。そうすると、このスライド操作はスライドスイッチ２３０により検出され、その検知信号Ｌ４は項目移動検出回路４２においてそのレベルが判定される。そしてこのレベル判定によりポインタＫ２の移動先が判定されると、その情報はＣＰＵ４４を経たのち赤外線送信回路４５からテレビジョン受像装置に向け送信される。

【００３３】テレビジョン受像装置では、上記操作情報が受信されると、その内容に従ってディスプレイ画面上のメニュー項目選択用のポインタＫ２の位置を、図４の矢印ＳＳ２に示すごとく項目Ｍ３からＭ５に移動させるための制御が行なわれる。

【００３４】以後同様に、ユーザが操作ボタン２１を前後方向にスライドさせるごとに、その移動操作の方向と移動操作量が項目移動検出回路４２で検出され、その検出結果を表わす操作情報がリモコンからテレビジョン受像装置に送られて、この操作情報に応じてディスプレイ画面のメニュー項目選択用ポインタＫ２の表示位置がステップ的に移動する。

【００３５】そうして選択したいメニュー項目上にポインタＫ２が移動し、この状態でユーザがクリックボタン２２０をクリック操作すると、クリック信号Ｌ５がクリック検出回路４３に入力されてクリック検出信号Ｌ５は項目決定情報Ｌ６が作成される。そして、この項目決定情報Ｌ６はＣＰＵ４４を経由したのち赤外線送信回路４５からテレビジョン受像装置に向け送信される。テレビジョン受像装置では、上記項目決定情報Ｌ６が到来するとポインタＫ２の現在位置に対応するメニュー項目を選択するための制御が実行される。

【００３６】以上のようにこの実施の形態では、円盤上をなす操作ボタン２１をリモコン筐体１１にスライド移

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動可能に設けて、このスライド移動操作をスライドスイッチ２３０で検出するとともに、上記操作ボタン２１の操作面を４分割してこれらの分割領域にそれぞれ圧力センサ２２１～２２４を配置して操作ボタン２１の押下操作を検出するようにし、上記スライド操作の検知信号Ｌ４を基に項目移動情報Ｌ７を生成するとともに、上記押下操作の検知信号Ｌ１を基にカーソル移動情報Ｌ２を生成して、これらの情報の内容に応じてテレビジョン受像装置のディスプレイ画面上に表示されているメニュー項目選択用のポインタＫ２およびカーソルＫ１の位置を移動させるようにしている。

【００３７】したがってこの実施の形態によれば、１個の操作ボタン２１の押下操作とスライド操作とにより、カーソルＫ１とメニュー項目選択用のポインタＫ２の移動とをそれぞれ行なうことが可能となる。このため、ユーザはカーソルＫ１およびポインタＫ２という２つの独立した操作対象に対する操作情報を、リモコンを持ち変えたり指の位置を大きくシフトさせることなくスムーズに入力することが可能となる。また、１個の操作ボタンを設けるだけですむため、各操作対象ごとに別の操作ボタンを設けたり切替スイッチを別途設ける場合に比べて、リモコンの小形化を図ることができる。さらに、操作ボタン２１を小形化する必要もないので、操作ボタン２１の小形化による操作性の悪化を招来する心配もない。

【００３８】またこの実施の形態では、圧力センサ２２１～２２４の検知信号レベルを予め定めた最低圧力検知感度レベルと比較して、この最低圧力検知感度レベルよりも検知信号レベルの大きい場合にのみ、検知信号Ｌ１を基にカーソル移動情報Ｌ２を生成するようにしている。このため、操作ボタン２１に対する押下操作をスライド操作とより一層明確に識別して検出することが可能となり、これにより誤入力の生じ難い操作性に優れたリモコンを提供することができる。

【００３９】なお、本発明は上記実施の形態に限定されるものではない。例えば、操作ボタン２１のスライド移動方向は一次元方向に限ることなく、二次元方向にスライド移動可能に構成してもよく、またスライド機構にクリック機構を設けて複数のポインタ２の移動をステップ的に行なえるように構成してもよい。

【００４０】また、前記実施の形態では、クリックボタン２２０を押下したときよりも下方の操作の方向が垂直方向でないと圧力センサ２２１～２２４およびカーソル移動検出回路４１が動作して、カーソルＫ１の位置が不本意に変化することも予想される。そこで、クリックボタン２２０が押下されたことが検出された場合には、このときカーソル移動検出回路４１で検出された操作情報を無効にする処理を行うようにしてもよい。

【００４１】さらに、前記実施の形態では、操作ボタン２１の押下操作を圧力センサ２２１～２２４を用いて検

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出するようにしたが、操作ボタンをその中心部を軸として揺動自在に構成し、この揺動動作を変位検出器等を用いて検出し、その検出結果をもとにカーソル移動情報を生成するようにしてもよい。

【0042】さらに、前記実施の形態ではこの発明をリモコンを用いて説明したが、この発明は他に例えばノート型あるいはサブノート型のパーソナルコンピュータや電子手帳、携帯電話機、携帯型テレビジョン受信機、ゲーム機などのキー入力部に適用することができる。

【0043】その他、操作ボタンの形状やその構造、操作ボタンの支持構造、スライド操作検出手段および押下操作検出手段の構成、操作対象の種類についても、この発明の要旨を逸脱しない範囲で種々変形して実施できる。

【0044】

【発明の効果】以上詳述したようにこの発明では、手指の腹部に対応する大きさを有する平板状の操作ボタンをスライド移動可能に支持体で支持する構造として、この支持体に対する操作ボタンのスライド移動情報を検出する操作検出手段を設け、さらに上記操作ボタン面に複数の圧力センサを分散配置して、これらの圧力センサの出力信号を基に上記操作ボタンに対する押下操作情報を検出する押下操作検出手段を設け、上記スライド操作検出手段および押下操作検出手段により、各々独立した複数の機能を動作させる操作情報を入力するようにしている。

【0045】したがってこの発明によれば、複数の操作ボタンを不要にして、操作位置を大きく移動させることなく複数の操作対象を手指1本で円滑に操作することができ、これにより操作性の向上と装置の小形化を図ることができるポインティング入力装置およびこの入力装置を備えた電子機器を提供することができる。

【図面の簡単な説明】

【図1】この発明に係わるポインティング入力装置の一実施の形態を示す平面図。

【図2】ポイント操作部の構成を示す平面図および側断面図。　、

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【図3】リモコン回路の要部構成を示す回路ブロック図。

【図4】操作対象としてのカーソルおよびポインタの表示例を示す図。

【図5】操作ボタンの操作状態を示す図。

【図6】従来のポインティング入力装置の一例を示す平面図。
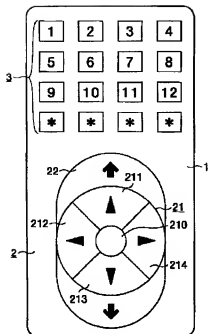
【図7】従来のポインティング入力装置の他の例を示す平面図。

【符号の説明】

1…操作パネル
2…ポイント操作部
3…キーボタン群
11…リモコン筐体
21…操作ボタン
22…操作ボタンの収容凹部
41…カーソル移動検出回路
42…項目移動検出回路
43…クリック検出回路
44…ＣＰＵ
45…赤外線送信回路
210…操作ボタン面の中央部
211〜214…操作ボタン面の4分割された周囲部
220…クリックボタン
221〜224…圧力センサ
225…信号伝達用可動接点
230…スライドスイッチ
240…センタデフォルト復元部
L1…押下検知信号
L2…カーソル移動情報
L3…メニュー項目選択情報
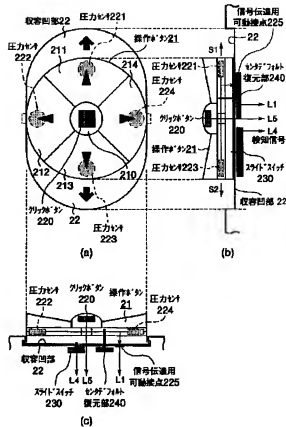L4…スライド検知信号
L5…クリック信号
L6…項目決定情報
L7…項目移動情報
L8…変調された赤外線

＊

【図5】

【図１】

【図２】

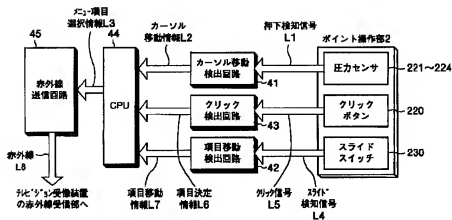
【図３】
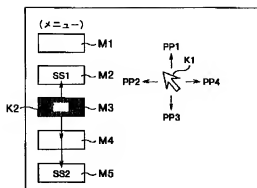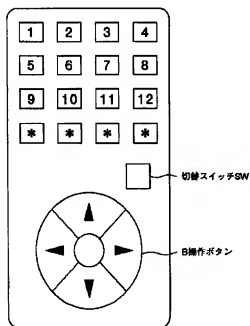
【図4】

【図6】

【図7】